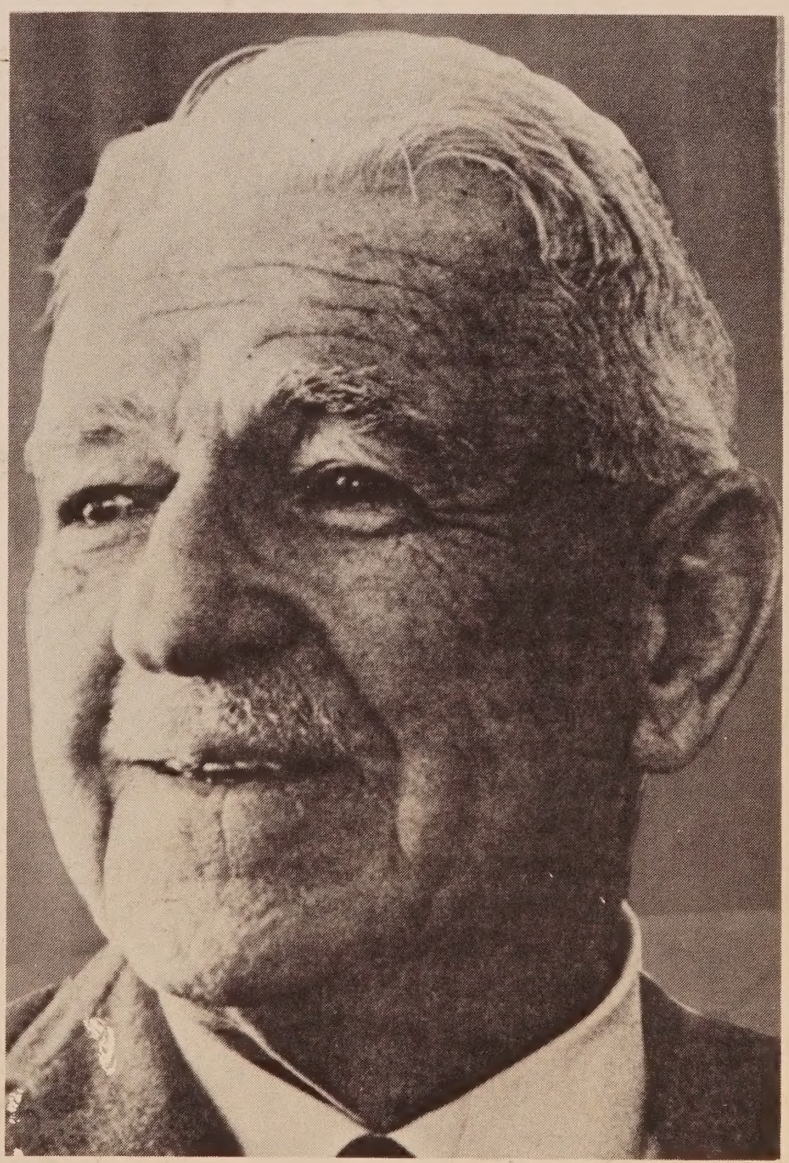
The Antique Radio Gazette

OFFICIAL PUBLICATION OF THE ANTIQUE RADIO CLUB OF AMERICA

VOL. 9 WINTER NO. 1



The first Ph.D. in engineering at Stanford was earned by Leonard F. Fuller in 1919 in electrical engineering. A pioneer in wireless telegraphy and later in radio, he graduated from Cornell in 1912. His dissertation concerned the design and behavior of 1,000 kilowatt arcs (arc converters). This study led to the installation of a trans-Atlantic communication system that was invaluable during World War I.

Dr. Fuller had a distinguished career in research with Federal Telegraph, General Electric, and International Telephone & Telegraph. He joined the faculty of the University of California in 1930 where he became head of Electrical Engineering. During World War II he returned to industry to conduct research for the Joshua Hendy Iron Works. In 1946 he came to Stanford as acting professor of electrical engineering, both teaching and coordinating Stanford's growing research program in engineering. He retired in 1954, and still lives in Palo Alto.

See Page 3

President's Letter

This is my first opportunity as president of the club to say hello to all members.

I would like to thank my predecessor, Ralph Williams, for the fine job he has done during his two years in office, and Dick Schamberger and his staff for the very worthwhile Gazettes they have published during the past two years.

We are looking forward to an interesting and eventful year, especially the June Meet to be held in Louisville, Kentucky, under the auspices of John and Marian Caperton, with the help of Mr. and Mrs. Gordon Eklund. They have planned a very exciting agenda for everyone and of course John's museum is a great attraction.

ARCA promotes social contacts among its members through these meetings which are held throughout the year in various parts of the country. It is this feeling of good will which we are anxious to cultivate, through the forming of chapters, nationally and internationally, with subsequent representation from each group on the Board of Directors of ARCA.

If anyone is interested in forming such a group, Dr. Ralph Muchow, 107 Center Street, Elgin, Illinois 60120, will provide information on the procedure.

Our membership rolls have topped the five hundred mark and we are continuing to grow. I am sure that 1981 will be another successful year.

We are looking forward to seeing everyone at Louisville.

John E. Drake, President

Notice

You will all have received the mailing regarding the ARCA Spring Meet to be held in Louisville, Kentucky, on June 4-6, 1981 at the Rivermont Holiday Inn.

The following lists the Old Equipment Contest Classes for the Meet.

1. Crystal sets made after 1920.
2. Wireless Receivers made before 1921, including Military sets.
3. Regenerative Battery Receivers.
4. TRF Battery Receivers.
5. Superhet Battery Receivers.
6. A.C. Radio Receivers.
7. Other receivers not included above.
8. Scanning Disk Television.
9. Spark and Tube Transmitters.
10. Audio Amplifiers, battery operated.
11. Magnetic Speakers.
12. Early and Unusual Wireless Items, WW-I era.
13. Advertising Material.
14. Books; Telegraph, Wireless or Radio related.

ATTENTION:

This will be the last issue of the Gazette for those who have not paid their 1981 dues. If in doubt, drop a postal card to Jane Denk, 81 Steeplechase Road, Devon, Pennsylvania 19333. Thanks.

The Indiana Historical Radio Society-AWA is having its Spring Meet on May 9, 1981, at Auburn, Indiana. It will be held at the Auburn-Cord-Duesenberg Museum, starting at 9:00 A.M. The Banquet will be held at 7:00 P.M. For advance reservations, write or call —

Ross Smith
1133 Strong Avenue
Elkhart, Indiana 46514

The Mystery of Dr. Fuller's Wireless Telegraph Key

by John Milton Williams

In the early part of last year, when Vic Politi (W1NU) first showed me this unusual key, it was in a sorry state. The entire area of the instrument was encrusted with a whitish substance resembling petrified salt. Its peculiar size and design fascinated me, nevertheless, and we eventually got down to horse-trading. Reluctantly, I swapped him an early Marconi military wireless key, which I valued highly, for this intriguing pile of corrosion.

Since Vic is a most interesting gentleman who seems to know a lot about everything, we were up into the early hours of the morning in a most enjoyable bull-session. He explained that he knew nothing of the origin of the key, that he had obtained it from a friend who had apparently gotten it from the estate of Ernie Johnson, Sr., a ham who had lived in nearby Bridgeport, Connecticut, and had been in the salvage business at one time.

When I got home that night, I found myself contemplating the uniqueness of the key. Carefully, I dismantled it. Removing the small engraved plate under the lever arm, I was able to read "Federal Telegraph Company — Poulsen System — U.S. Patents." That turned out to be the only marking on the key. I then removed the rest of the parts and put them in a rock polisher cannister to which I added a bottle of Noxon. I placed it onto the slowly revolving machine and went to sleep.

Miraculously, the following day when I removed the parts from the polisher, they were completely free of corrosion and, except for a slight pitting on a few spots, almost as good as new. A buffing with pumice and OZ cleaner restored the deep-brown bakelite base and lever arm to their original lustre. I then lacquered the brass and finally reassembled the key and gazed in awesome delight at its beauty.

The more I contemplated the key, the more I was aware of my profound ignorance of the Poulsen System. Only vaguely, I recalled hearing old-timers mention the "Poulsen Arc." A search of the encyclopedia revealed only that in 1889 Vladimir Poulsen, the noted Danish inventor, had succeeded in developing a wire recorder. Surprised at the early invention of the wire recorder, but with no more knowledge than before about Poulsen's Federal Telegraph Company connection, I spent hours scanning all my early-wireless books for any mention that might reveal the origin of this marvelous key I now possessed.

A copy of Modern Electronics Magazine, dated May, 1911, turned out to be my first discovery of importance. On page 112, an article by E. A. Mayne, Chief Operator, Poulsen Wireless Company, caught my eye. The article explained that the formation of the Poulsen Wireless Telegraph and Telephone Company had occurred and that it had been financed with a capital of $25,000,000 by a group of San Francisco millionaires under the laws of the State of Arizona. Further, the article stated, a number of stations were already in operation, and a Poulsen station located in El Paso, Texas, had successfully communicated with one in San Francisco—a distance of 1,250 miles, believed to be a world's record for daylight transmission at that time. It also noted that as far back as 1906, the Poulsen system of the undamped wave had been utilized to transmit between Lyngby, Denmark, and Cullercoats, England. My total

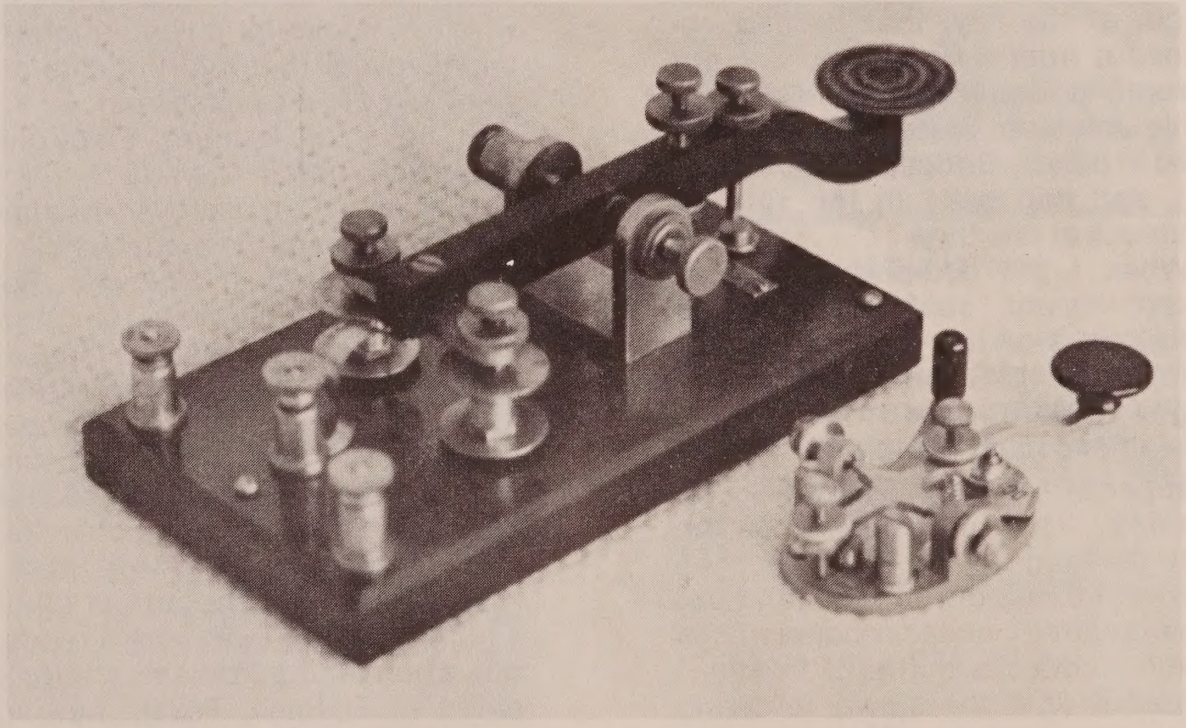
ignorance was somewhat alleviated by this discovery; at least I was on the right track in unravelling the mystery of my key.

I found several brief mentions in other books and the Cyclopedia of Electricity published in 1914 had lots of technical information on Poulsen's "singing arc," but no mention of Federal Telegraph or my key. (I did note that this publication spelled Poulsen's first name "Valdemar," while my modern encyclopedia spells it "Vladimir," though I still am not certain which is correct.)

Erroneously, I had assumed Federal Telegraph was in some way associated with the Federal Radio Company, whose fine sets we're all familiar with. I found I was not alone in this assumption, since every old-timer I talked to about my Federal Telegraph key thought it was somehow used by Federal Radio. I could find no one with any real knowledge of the Poulsen System among my acquaintances.

in nearby Stamford, Connecticut. I had not met Art, but this turned out to be the most important link to the mystery of my key. I was overwhelmed by Art's gentlemanly manner and vast knowledge of early radio. When I showed him the key, he explained that he had met the former chief engineer and later vice president of Federal Telegraph, that his name was Dr. Leonard F. Fuller and that he lived near the original Federal Telegraph Company site in Palo Alto, California. He assured me that Dr. Fuller was the finest of gentlemen and would reply to my inquiry about the key.

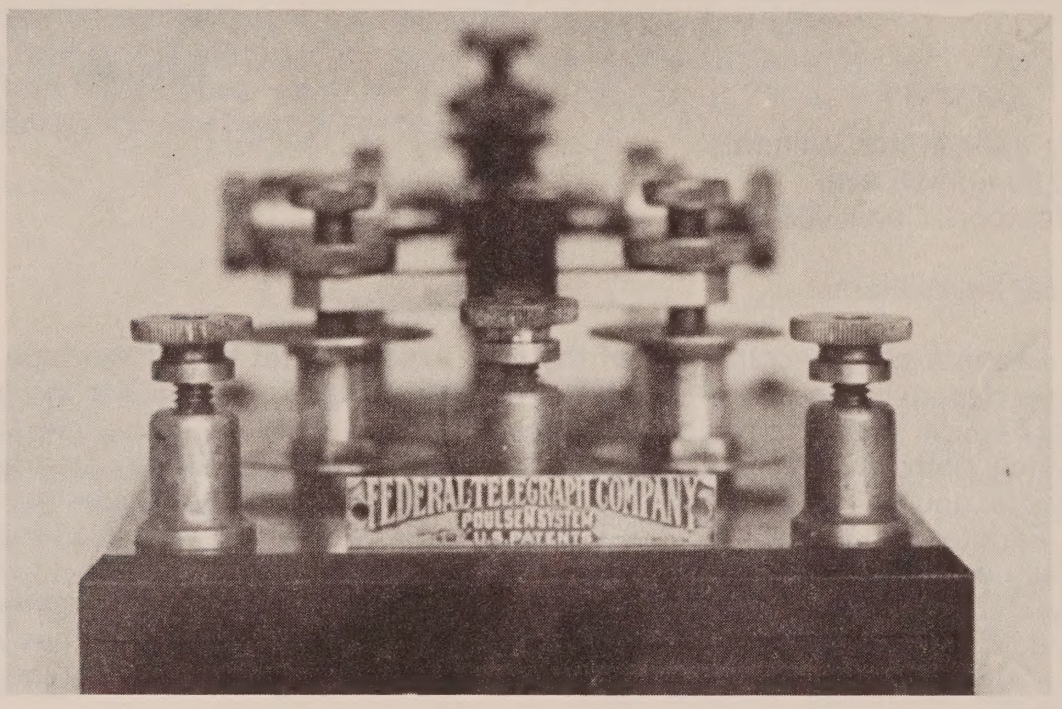
With some hesitancy and great anticipation, my letter to Dr. Fuller was sent. Surely, I thought, this distinguished man will not want to be bothered with some lunatic collector asking about a key. Obviously, Dr. Fuller would have seen oodles of Federal Telegraph keys and would not be at all concerned that I had discovered one. It seemed logical to



I was planning to write to the Antique Wireless Association for information when someone—I can't recall who—asked me if I had ever met Art Goodnow (W1DM) who lives

me that this was a standard Federal key and that possibly dozens of other collectors had written for information about them. I really did not expect a reply, but I would wait and see.

A week or so passed until I opened my mailbox and found a letter from Dr. Fuller. Hurriedly, I ran back to my house and carefully opened the letter. In it, Dr. Fuller said that he did think he recognized this key, but in his scientific thoroughness, wanted more exact information than I had originally supplied.



With greater care and exactness than before, I measured every part. The key weighs one and three-quarters pounds. Its chocolate-brown bakelite base is made of one-inch thick material measuring eight by four inches; the matching curved lever arm is eight inches long, three-quarters of an inch in height and five-eighths of an inch thick. The second set-screw from the button is an adjustment for the spring tension underneath the lever. The center support is of cast brass and the fulcrum set-screw tension is provided by a spring hidden in a brass tube on one side. Up to this point, except for the massive size of the key and its parts, it's of fairly normal construction. However, when we get to the other end of the lever, whereon are attached the contacts, things really become fascinating! A two and three-quarters inch brass bar is set into the end of the lever, and on both sides are attached two enormous solid silver contacts, each of which is a half-inch in diameter and a quarter-inch thick. These rest on two matching contacts secured to the bakelite base. Altogether the four silver contacts weigh two ounces. They are sandwiched between brass discs, measuring one and one-eighth inches in diameter, which acted as shields for flying sparks. At the top of each of the two contacts are adjustable set-screws. The center bar is connected to the center binding post via a ribbon of quarter-inch copper, which is common to both contacts at the top. The other two binding posts are connected underneath to the individual contacts at the bottom. When the lever is depressed, the contacts are broken. (This arrangement, I am told, was because the Poulsen continuous arc system's transmission was achieved by breaking the circuit, thereby creating a musical, clear tone. I am probably wrong on this, but that's the way I comprehend it.) I included actual-sized drawings of all the parts in my letter to Dr. Fuller and anxiously awaited a reply from him.

It is difficult to express my delight when, a week or so later, I received the following letter:

LEONARD F. FULLER
2345 WAVERLEY STREET
PALO ALTO, CALIFORNIA 94301

February 16, 1980

Mr. John Milton Williams
53 Evergreen Ave.
Westport, Conn. 06880

Dear Mr. Williams:

I have a clear recollection of the first experimental key of the type you have described so well in your letter of February 12. It was built in the original Federal Palo Alto factory; probably in 1913, possibly in early 1914, to my pencil sketches and materials specifications. I remember very clearly my mental debate and final decision to include spark shields in the design.

Federal had a group of 7 or 8 German, Austrian and Swedish European trained instrument makers who built beautifully machined and finished laboratory research equipment from rough pencil sketches and materials specifications. They were proud of their work and were unhappy if they were not allowed to lacquer all brass parts — hence my question about lacquer finish.

The key I sketched was needed in the early R&D I was doing leading to the Federal line of arc transmitters which ultimately ranged in power from 2-1000 kw. At that point in time one pair of silver contacts of the size on your key had been found to be fully loaded by a 30 kw arc transmitter. The immediate problem was to develop the best circuitry to maintain equal loading on each of the multiplicity of contacts no matter in what sequence they opened and closed. This key with 2 pairs of contacts would hopefully handle a 60 kw arc transmitter. Of course, in a station handling traffic, solenoid operated and not hand operated contacts would be used to keep the operators hand away from danger.

Our tests with this key were successful and we shipped a multiple contact solenoid operated relay key with a 100 kw arc set to Panama Canal Zone for the U.S. Navy Darien station in 1914.

Multiple contact relay keys were followed by a standardized relay key with a single pair of contacts. The number of relay keys used depended on the kw rating of the arc transmitter, wave length specifications, etc.

I was doing some of the key (and arc) research testing in a laboratory at the Federal, South San Francisco station when I would not delay handling Honolulu traffic. So the key we were discussing went to South San Francisco where I determined the power it would handle with various experimental key load equalizing circuits. We renewed the contacts if we burned a set too badly.

The traffic department operators also used it at my request on some Honolulu night press traffic. In that way I was able to learn the opinions of both sending and receiving operators on a 2200 nautical mile circuit. If Honolulu liked the received signal quality the experimental keying circuits must be OK from the receiving operator's viewpoint.

I have no recollection of what happened to this research key. Nor do I remember any more such keys being built. In later years the factory could have filled an order for them without my knowledge. I have no good idea why anyone would have placed such an order.

To the best of my knowledge you have a "one of a kind" key built for research purposes. I hope that some day you will learn how it travelled from San Francisco to the East Coast possibly during World War I.

I am finding the Mackay brochure on submarine cable repair very interesting and informative. As soon as I finish reading it, I'll return it to you. Many thanks for your thoughtful kindness.

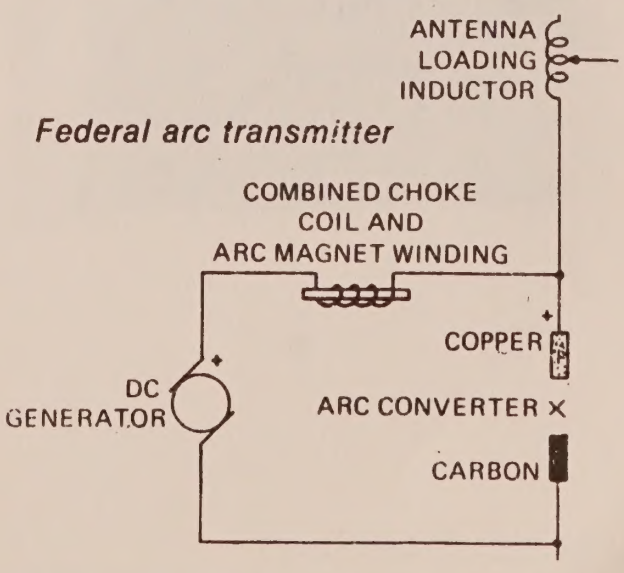
Sincerely,

Leonard F. Fuller

To say this letter was and is the high point of my years of collecting is a vast understatement. I was ecstatic! Sixty-six years after he had last held it in his hand, I had actually found the maker of this one-of-a-kind key. A unique piece of wireless history had been authenticated by its distinguished designer! The greater part of the mystery was solved, but now I'm hoping to discover how and why the key wound up in Bridgeport, Connecticut. I'd welcome any and all suggestions that any members may have that might add clues to solving the puzzle. If anyone thinks he or she recognizes the key from some past experience, please contact me.

Needless to say, I cannot adequately express my thanks to Dr. Fuller for his kindnesses, but the writing of this article is an attempt to do so. Perhaps rescuing the key from certain obscurity and preserving it for posterity is the best thanks I can offer. I would like him to know that often, when I take the key out of its glass case where it is prominently displayed in my home, my imagination soars with thoughts of his early experiments. At times I actually convince myself that I can still hear the crackle of the sparks, smell the burning ozone and share the excitement of radio's infancy. Dr. Fuller played such an important role in those early days. Surely in some distant year, another radio enthusiast will see his key and imagine, as I have, that he hears Dr. Fuller's messages and will be as awed by his accomplishments as I am.

It has also occurred to me that if, as learned scientists assure me, radio waves travel continuously through space forever, then some future listener on a distant planet may monitor the strange signals from the Milky Way galaxy. Then Dr. Fuller's early messages will be one of the first that distant stranger hears. I like to think they'll be the ones he sent from the San Francisco South Station while using this key.



Federal arc transmitter

END

Antique Radio Club of America Inc.

81 Steeplechase Road
Devon, Pa. 19333

29 December 1980

Mr. Harris W. Houck
c/o Gervis & Novy
1300 Route 46
Parsippany, N.J. 07054

Dear Harry:

What a pleasant surprise it was to receive again from you, by way of Oscar Gervis, CPA, your check in the amount of $1,000.00, representing a gift from you to the Antique Radio Club of America, Inc. Club President Ralph Williams, and Club Vice President Mel Comer, join me in expressing, on behalf of our Club, our great appreciation for this generous gift.

With your gift, our Club proposes to purchase a high-interest Savings Certificate. It is the Club's intention to employ interest proceeds from this and previously-acquired certificates in the advancement of our Club's educational pursuits relating to the preservation of the history and apparatus of early wireless communications.

The patent litigation that I have been involved in, as a consultant, and that has taken so much of my time the past few years, should come to trial in February and March, 1981. When that is concluded, I look forward to retiring again and enjoying the luxury of devoting much more time to this most interesting hobby of ours.

I suspect this will find you in Florida enjoying the warmer weather. My wife, Jane, and I wish you a most pleasant winter season.

Sincerely,

William E. Denk
Secretary/Treasurer

c.c. Ralph Williams
Mel Comer
John Drake

Little Known Men In Wireless

By Guy M. Martin, Jr.

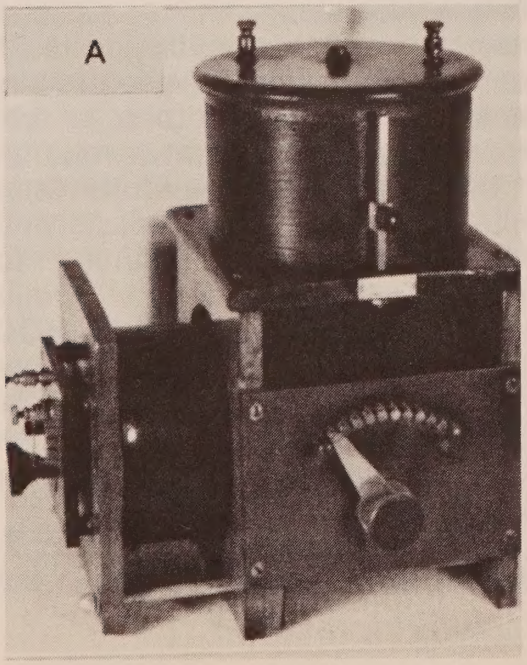
L. W. Stevens was born in Boston in 1886. He grew up in the Boston area, and graduated from M.I.T. in Electrical Engineering in 1909.

After looking around in the Boston area, he decided to go to work for Melville Eastham, founder of Clapp-Eastham in Cambridge, Mass. His first job was to work in the prototype department following the suggestions and ideas of Mr. Eastham.

His interest turned to Amateur Radio and in 1912, he got his license and went on the air. He used his initials as his call LWS. With this new interest, he combined his ham requirements and desires with the Company designs. He developed many of the early ham components along with the ideas of Mr. Eastham. Most of the early development by Mr. Eastham was along the lines of test equipment rather than components.

The photographs show some of his early prototype equipment that he used in his own ham station.

A. Loose couple up to 6,000 meters.
B. Audion Detector stand.
C. Dual audion detector receiver for long and short waves.

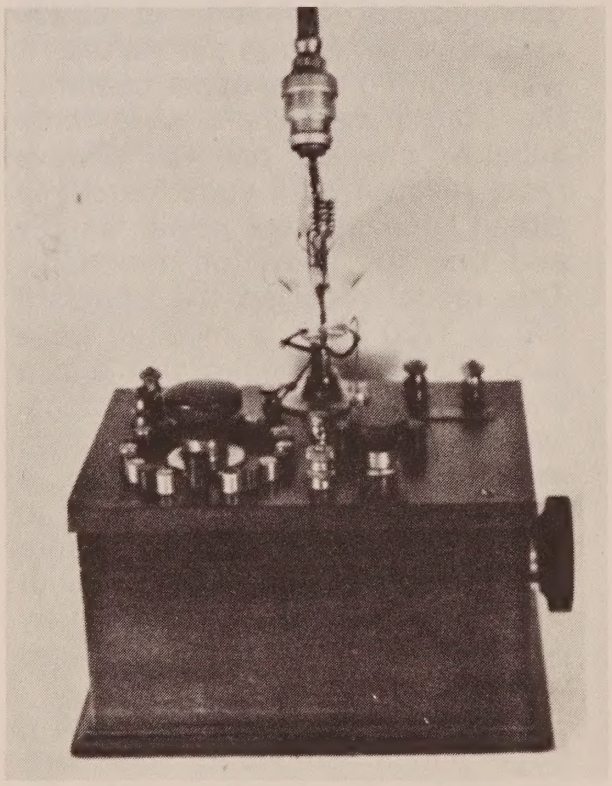


A

He tagged all of his equipment with a brass plate with his name and Cambridge, Mass.

In 1915, when Eastham sold Clapp-Eastham to fund General Radio, where he could continue the test equipment phase of manufacturer, Stevens followed to become Senior Developmental Engineer. Here he continued with component development of variable condensers, variable inductances, and ham test equipment.

It is not known how long he worked for General Radio, but the old timers say it was for a long time.



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Continued on page 19

Early RCA Television Receivers

By Kenneth McIntosh

In addition to an early test model 359 of which only about 50 were made for organization employees and a table television model TT-5 which depended on a separate radio receiver for tuning in the sound, RCA made three console models in 1939. One was the most economical, one more refined and one that was deluxe. This was an interim era. Some stations were broadcasting with 441 lines and some were converting to 525 which produced a better picture. RCA tried to design something suitable for each area receiving these transmissions.

The economy television radio kit model TRK-5 had a *5-inch* cathode ray tube 1802 with *electrostatic* deflection of *441* lines at 13,200 cycles and 30 frames per second. It was mounted in the upper center of the front panel. There were three separate chassis, one 429 allwave radio receiver with superhetrodyne circuit, one allwave power supply and one for television functions. This model received the standard 540 to 1720 band, a medium wave band 2.3 to 7.0 megacycles and a short wave band 7.0 to 22 megacycles. The 5 television channels were 44 to 50 mc., 50 to 56 mc., a skip to 66 to 72 mc., a skip to 78 to 84 mc. and 84 to 90 mc. The picture that this model produced was about 3¾ by 4¾ inches. It was seen by direct viewing on the front panel without mirror reflection.

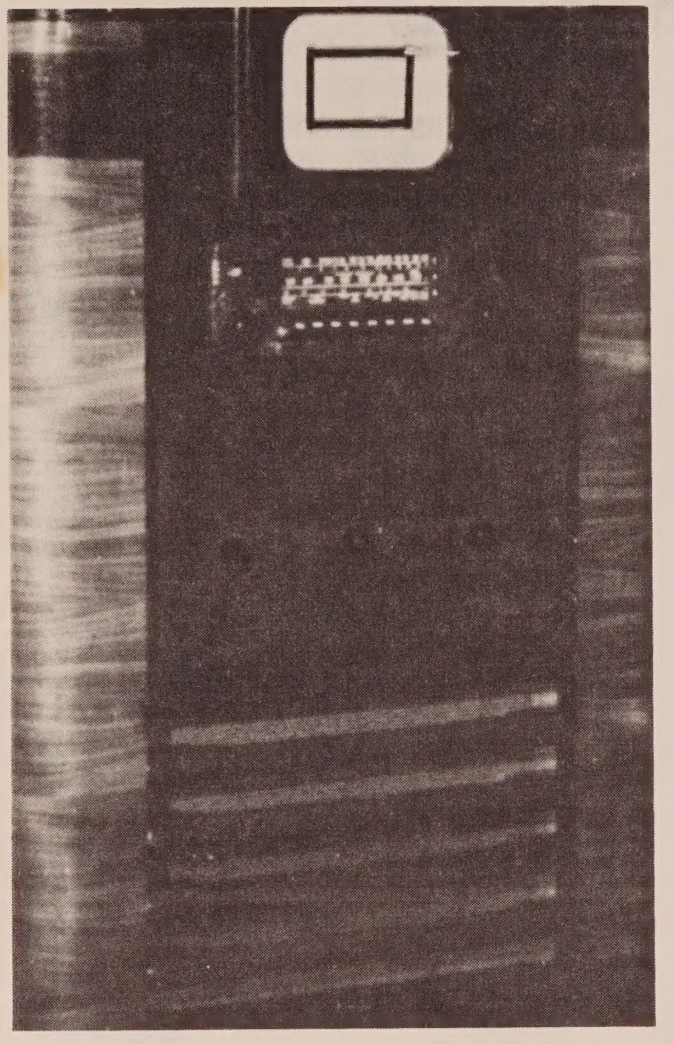
The refined model TRK-9 had a larger *9 inch* cathode ray tube number 1804 with *electromagnetic* deflection of *525* lines at 15,750 cycles per second. It had four separate chassis, one for video, one for video power supply, one allwave receiver and one power supply for allwave. The allwave sound chassis had 12 tubes, a push pull circuit and a power output of 12 watts. There was a 12 inch speaker and the high fidelity system was much better than the economy model. This improvement together with the larger picture made a quite acceptable receiver.

The deluxe model TRK-12 was similar to the TRK-9 but with a *12 inch* cathode ray tube number 1803 mounted in a vertical position. The picture was viewed by raising the console cabinet lid which had a mirror on the underside. It could be opened to any angle and stayed there so that the image was visible from either a standing or sitting position. This was the most popular model and many were sold to the public. The cabinet was designed by John Vassos, an industrial and graphic artist whose work had a widespread influence on industry in the 30's, 40's and 50's. It was clearly meant to represent the finest contemporary design of the time and adds to the appeal that this set has among collectors of both television and industrial design.

Carleton Sarver in New York City who has two of the TRK-12 models and keeps them working says, "Whenever partially restored electronically, a TRK-12 performs quite well, producing an acceptable — if somewhat dim — picture from a strong signal. Since vertical and horizontal synchronizing circuits were somewhat primitive, almost constant adjusting of the controls is necessary. Otherwise one is impressed by the excellent resolution of the picture. Some circuits were changed in the video chassis and the model number changed to TRK-120. The DC restorer circuit was removed along with the AGC and a limiter was added. A number of TRK-12's and TRK-120's were modified by a booster high voltage supply to give a brighter picture for demonstrations."

There are several TRK-12's in private collection including one in the

Roosevelt mansion at Hyde Park. Having one and working on it can be very interesting. END



RCA TRK/5 1939

We are presenting this article for those members who are developing an interest in early TV and who wish further information on the subject. The author is a pioneer collector and not alone writes on the subject but also gives lectures to area groups. Ken has written a monograph of 52 articles of which this is one on the subject. There are still a few of these available and if you contact Ken, he will give you further details.

In the next issue, I will feature an article on the restoration of a Dumont 180 TV. This set made it's appearance in 1939 and was the first commercial unit available to the public.

Jack Davis, Television Editor

OUR NEWEST MEMBERS:

Robert Arrowsmith, Annandale, VA
Ralph and Rosemary Dittmer, Mundelein IL
Bruce Gunn, Silver Spring, MD
Elmer Engman, Duluth, MN
Mrs. Paul Klewer, Lexington, MI
Merrill Bancroft, Townsend, MA
Robert Wilkinson, Boulder. CO
Joseph Smolski, Phoenix, AZ
Stephan Johnson, W. Bloomfield, MI
AEC Howard Adams, Midwest City, OK
Edward Martin, Cleveland, OH
Ken Greenberg, Skokie, IL
Donald French, Lombard, IL
John Doak, Woodstock, NY
Wayne Chapman, Lakeland, FL
Larry Mantel, Acton, MA
James Moffett, San Antonio, TX
Thomas R. Myers, Detroit, MI
Orval Wright, Hurricane, UT
David Herlinger, Katy, TX
Barry Nutting, Santa Rosa, CA
Joseph L. Schmid, Reseda, CA
Kenneth Caplin, Orange, CA
Howard Plouf, Chicopee, MA
James Ballard, Huntsville, AL
George Kitchen, New Milford, NJ
Felix Kernagis, Toms River, NJ
Herbert Parsons, Jr., Peabody, MA
Richard Evans, Souderton, PA
T. Jeffery Evans, St. Paul, MN
Brian Sexton, Coldwater, MI
Marino Ruggere, Shillington, PA
Wm. J. Scott, Winnepeg, Canada
(This is a far-out collector — his box 9850 (FOX-3) is the address of a Dewline Station in the center of Baffin Island — 1,500 miles from the nearest ARCA member?)
Archie F. Shearer, Paradise, PA
Raymond Chase, Plainfield, NJ
Jeff Lendaro, Danbury, CT
William Taylor, Unionville, PA
James Hendrickson, Detroit, MI
Thomas Wensel, Reston, VA
Daniel Eyring, Acton, MA
Joseph Brown, Sudbury, MA
Cleon Boothe, Seminole, FL
John Pisarski, Morristown, PA
Paul Bischoff, Burlington, IA
Joe Szabat, Oil City, PA
John Bayusik, Wallingford, CT
DeWitt Bills, Minneapolis, MN
Dale Boyce, Eau Claire, WI 54701
Lawrence Laney, Melbourne, FL
Randall D. Cain, Grosse Pointe Woods. MI
Paul Pigeon, Essexville, MI
James Stuart Davis, Lubbock, TX
John Haught, Aliquippa, PA

PAUL WARE

By Alan Douglas

Sooner or later, the serious radio collector is bound to come across a brainchild of Paul Ware. In a career spanning fifty years, Ware contributed a succession of innovative products to the radio and electronics industry, from WWI trench radios to the television Inductuner.

Born in East Orange, N.J. in 1893, Ware went to sea as a wireless operator from 1907 to 1912, and was one of the first three men in the U.S. to hold an operator's license. He enrolled at Stevens Institute of Technology in Hoboken, obtaining his M.E. in 1917. At Stevens he studied under L. A. Hazeltine, and in his senior year he and Hazeltine collaborated in the design of what later became the BC9 or SCR77 receiver-transmitter (a later version, BC9A, is pictured here). Quoting Hazeltine:

> "In 1917, I worked in collaboration with Paul Ware, then a student of mine, on a two-way radio telephone and telegraph system in which a single tube was used for transmitting and for receiving, the two portable stations being synchronized (zero beat) for telephony and heterodyning for telegraphy. On the system and the [method of] shielding I received my first two patents. Ware joined the Signal Corps, which after some further development by him adopted the system."[1]

A year later, Hazeltine designed the SE 1420 receiver at the Washington Navy Yard, which work led to the Neutrodyne principle.[2] After the war his association with Ware continued; his patent 1,379,184 on the BC9 shielding being assigned to the Ware Radio Corp. in May 1921. In the fall of 1922, Ware engaged Hazeltine to design his first entry into the broadcast market, the model AD2, advertised from November 1922 to June 1923. While working on this model, with its untuned RF stages, Hazeltine conceived his Neutrodyne circuit and was encouraged by several small radio manufacturers to license its use to a select group of them as a means of competing with the Radio Corporation. Ware became a member of the group, and by late 1924 was advertising a line of three basic Neutrodyne models, each quite different. The three-tube model T is not much to look at, inside, but was particularly well engineered for volume production.

In June 1925 Ware signed contracts with the Music Master Corp.[3] of Philadelphia, by which all his production was to be marketed by Music Master under their joint names. Music Master, who had grandiose designs of becoming the "General Motors of radio," owned no factories, but contracted its manufacturing to Ware, Thermiodyne, Sleeper and others.

Ware made two models for Music Master. The first, model 50 ($50), the cheapest in the line, was a four-tube adaptation of the old Ware model T. For the second model, however, Ware pulled all the stops. He created a seven-tube, totally shielded Neutrodyne with one-dial control, so sensitive that its antenna was a small rotating loop contained within the radio cabinet. In its use of shielding it was contemporary with the Stromberg-Carlson Treasure Chest, and in overall design was two years ahead of similar Fada and Freed-Eisemann models. At $250, this model 250 was not cheap, but Music Master placed large orders with Ware and advertised it heavily for the coming Christmas season. Unfortunately Music Master overextended itself and defaulted on its payments after Ware had produced 20,000 of them.[4] The New York factory closed, and the trade papers carried reports of these sets being dumped at cut rates by department

stores. In the three years following, Ware consulted for Sonora, Thompson, and Splitdorf.

Frederick K. Vreeland was an engineer who had started with Fessenden in 1903 but soon left over a patent squabble, and who for many years afterward backed the wrong horse in trying to make mercury-vapor tubes generate RF. He maintained a small lab at Stevens, near Hazeltine's, and in January 1928 demonstrated a new tuning circuit arrangement to the IRE. While ordinary tuned circuits varied their selectivity across the broadcast band, Vreeland's 'band-pass' circuit maintained equal 10 kc bandwidth and assured high-fidelity reception.[5] Ware obtained a license and by July 1929 was producing a fairly elaborate chassis using the Vreeland circuit. He interested the American Piano Co. and in early 1930 his Ware Mfg. Corp. was making 'Ampico' radios in high-quality Adler-Royal cabinets. However, the American Piano Co., owner of such prestigious companies as Mason & Hamlin and Chickering, was rapidly sinking into oblivion as the market for luxuries evaporated in the Depression, and they soon gave up radio.

Paul Ware, seeing that inexpensive radios were the wave of the future, designed a mantel set, the 'Bantam' and by late 1930 his Trenton, N.J. factory was humming. In June 1931 Ware produced two superhets, and a half dozen other models in the year following, but there is no mention of the company again after 1931 in the trade magazines or Riders.

In July 1934 Ware joined Emerson as chief engineer; in the January 1935 ELECTRONICS he described his new model 19 design, a masterpiece of maximum performance from minimum tube count. He left Emerson in 1936 for Mallory, where he developed his 'Inductuner,' a continuously variable rotary inductance for high-frequency tuning.[6] His bifurcated sliding contact was a substantial improvement over competing designs and he was issued a valuable patent on it. Hoping to interest manufacturers in making receivers on this principle, Ware built a few sets incorporating his Inductuner, tuning 10 to 60 mc in one band. The model pictured was made for the James Millen Co. in 1940 and is serial no. 3. Mallory marketed the Inductuner after the war and it was used in many Du Mont and Andrea televisions.

In 1939 Ware joined Du Mont, rising to the position of General Manager by 1952, when he retired to Florida to organize Ware Marine Products to build automatic pilots for boats. In February 1963 the Radio Club of America presented Paul Ware with its highest award, the Armstrong Medal. He continued to head Ware Marine Products until his death in November 1970.

Footnotes

[1]Wheeler, "Hazeltine the Professor," Hazeltine Corp., 1978.

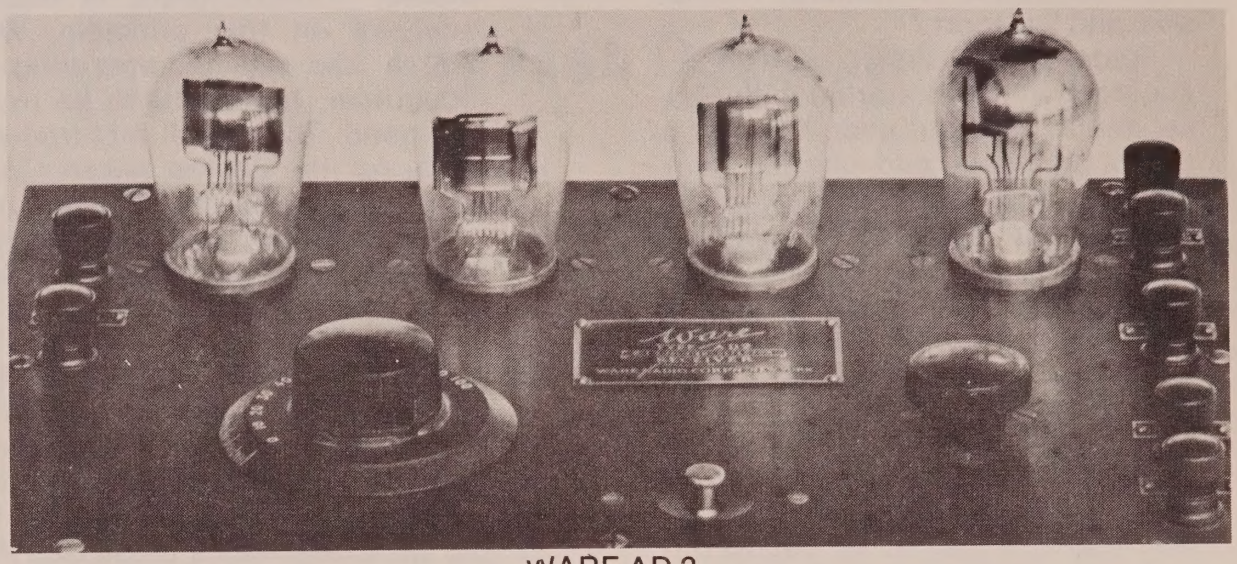
[2]RADIO AGE, April 1978. Also "Hazeltine the Professor."

[3]RADIO AGE, May 1980 has the Music Master story.

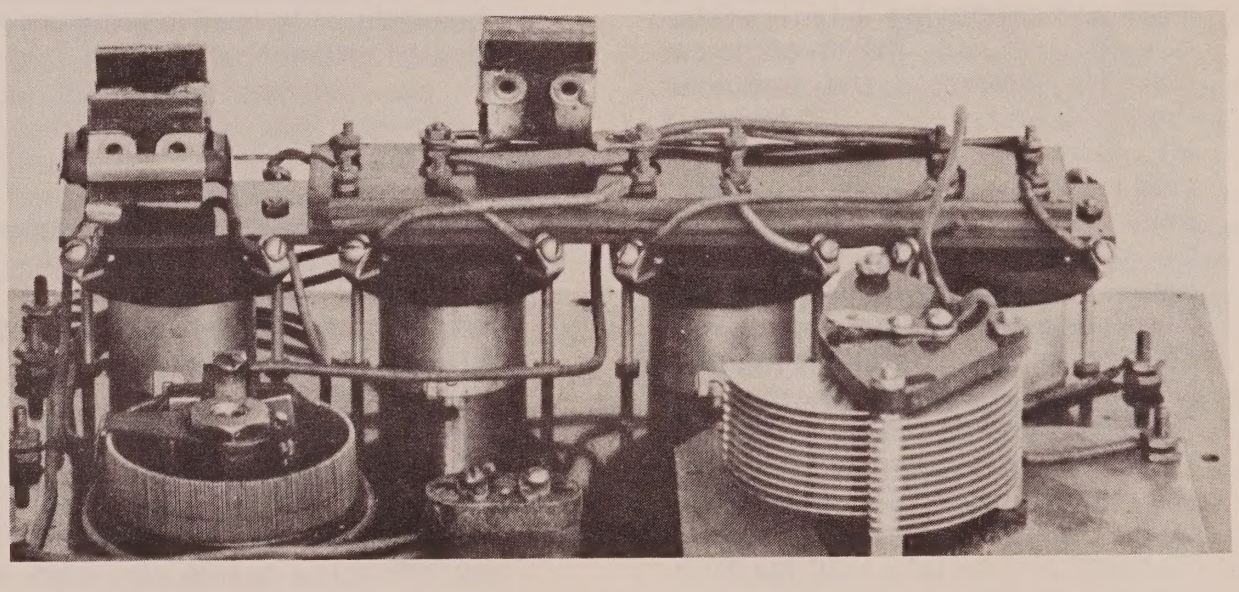
[4]RADIO WORLD, Dec. 26, 1925. The 20,000 figure seems very high, and although specifically stated to be for the seven-tube set, may have included the model 50. Many more 50s are known to exist, than 250s.

[5]Other manufacturers got similar performance with different circuitry, and National was the only other Vreeland licensee I am aware of. Harold Wheeler relates a story of the IRE demonstration: Vreeland, who in Wheeler's words was "not too bright," presented his circuit with "religious fervor." At the climax, Vreeland, who had pre-tuned his radio to a local station, threw the power switch, and as the radio warmed up its first words were "You're wrong again!"

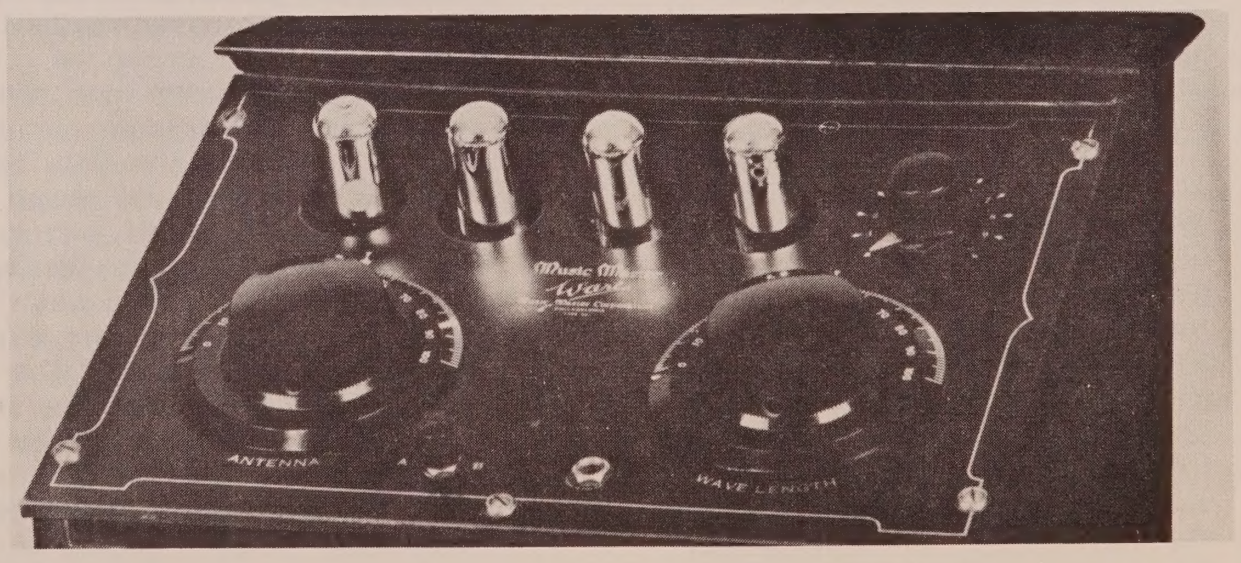
[6]PROCEEDINGS OF THE IRE, March 1938.



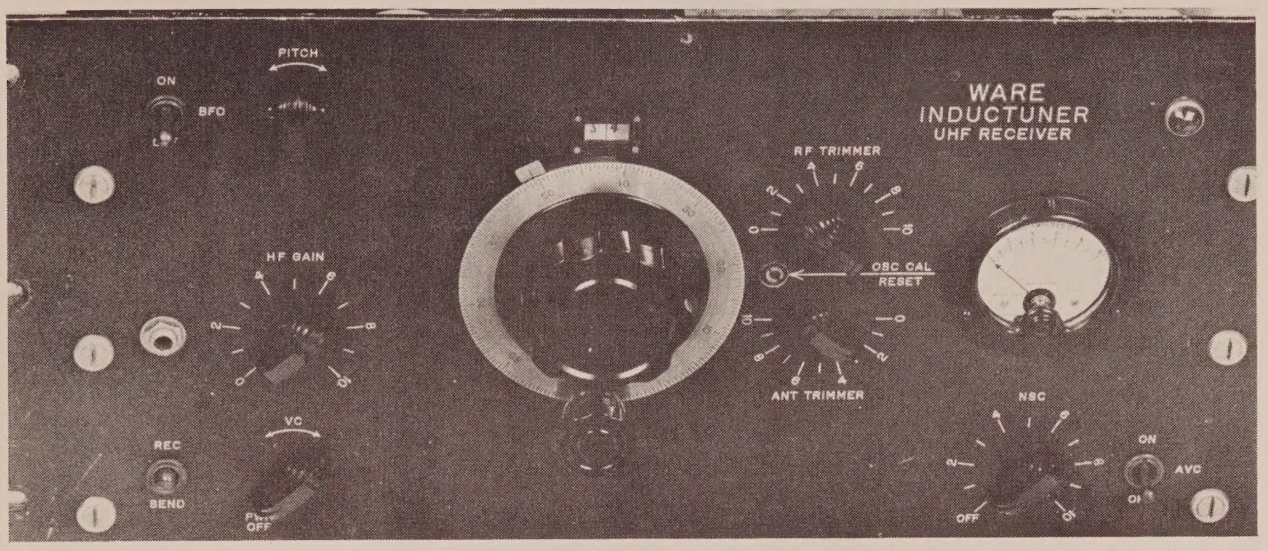
WARE AD 2

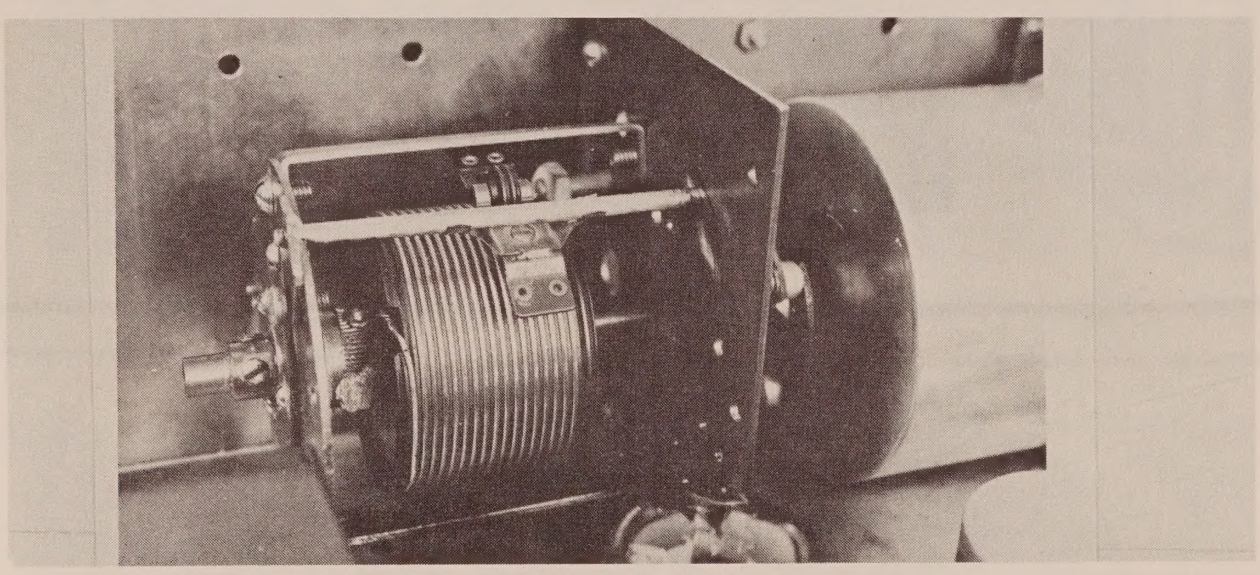


AD 2 INTERIOR

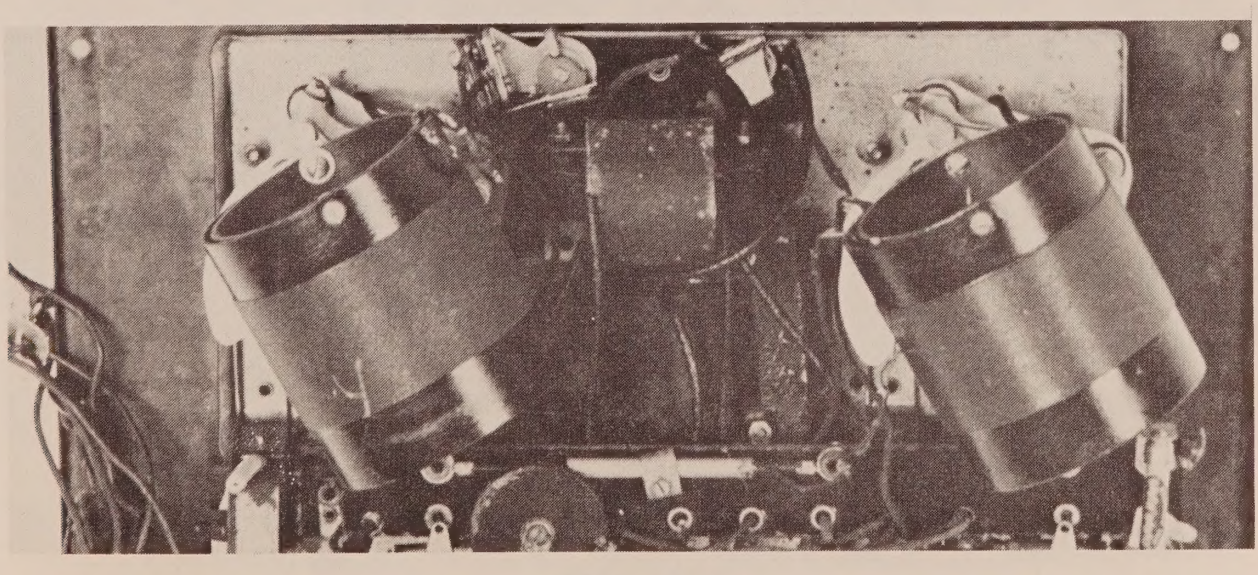


WARE/MUSIC MASTER MODEL 50

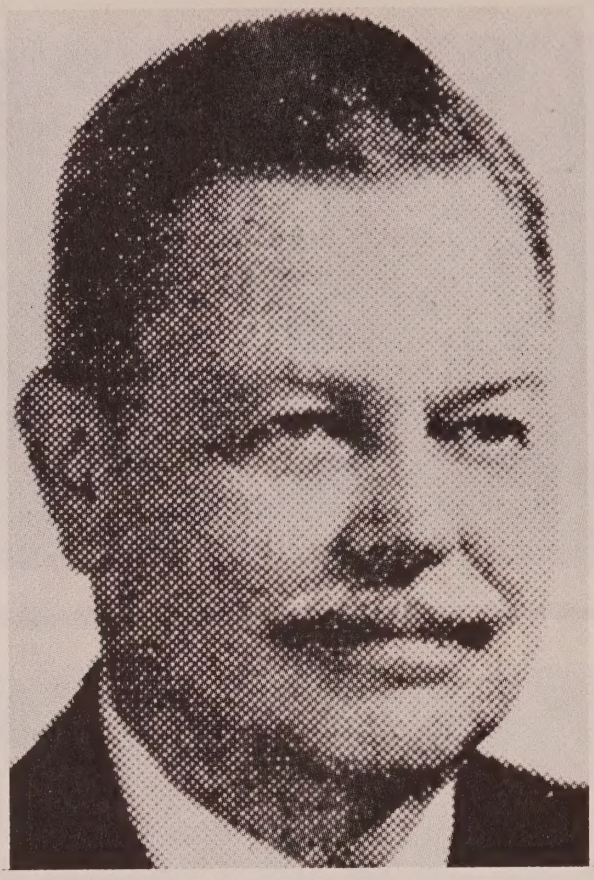




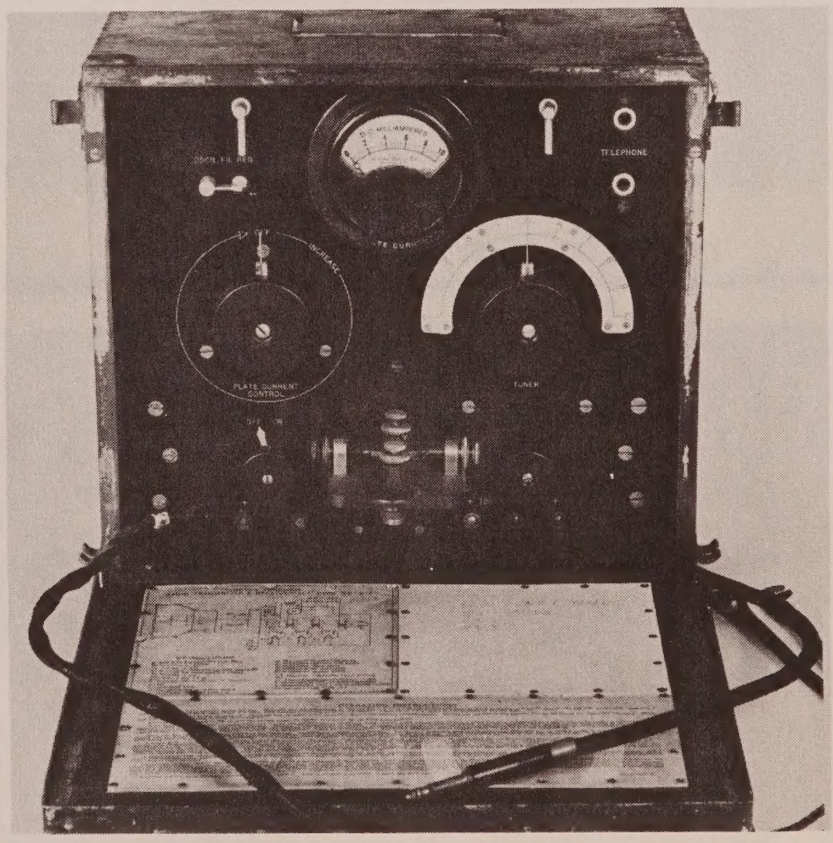
INDUCTUNER WITH SHIELD REMOVED



MODEL 50 INTERIOR



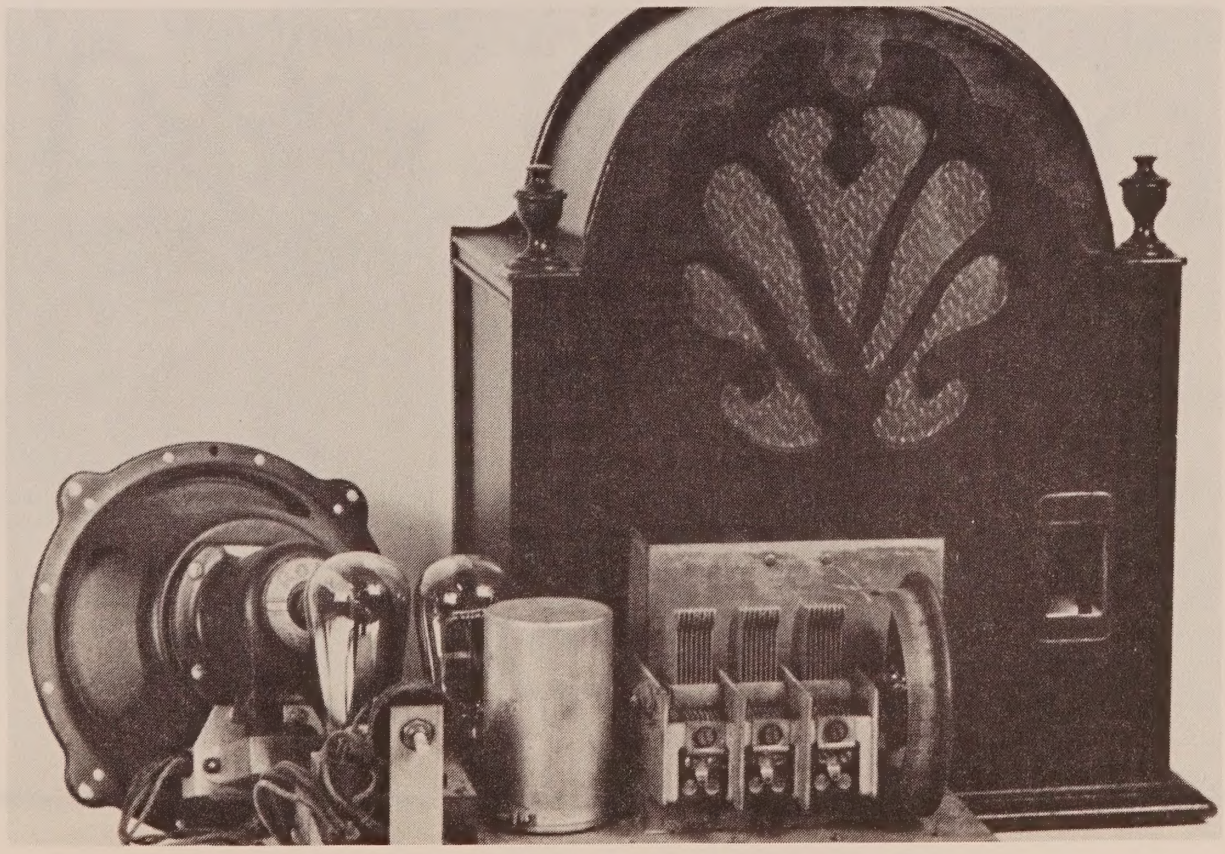
Paul Ware



BC9A (1929)

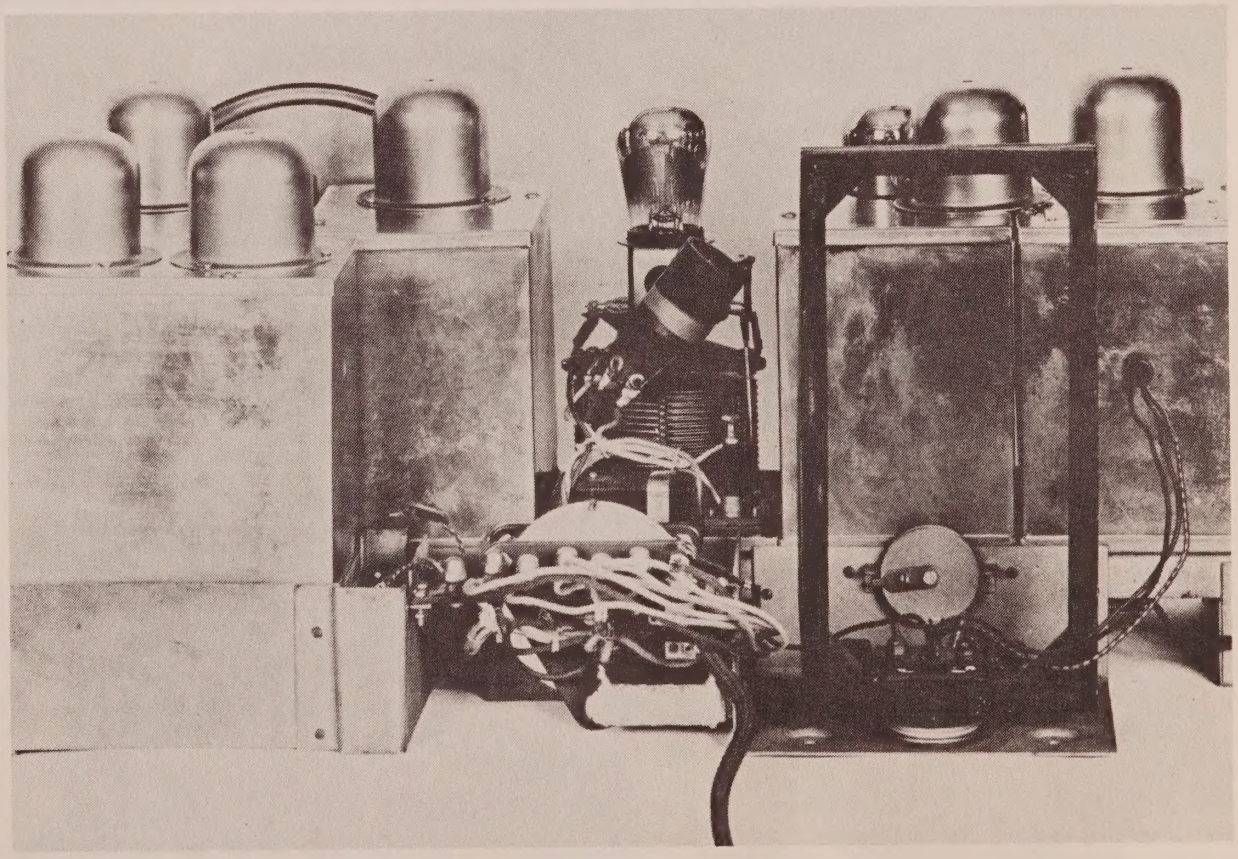
MUSIC MASTER-WARE TYPE 250

The ultimate in radio. Seven Tubes. Self-contained rotative loop eliminates antenna and ground. Wonderful range. Exquisite tone. One major control operates wave-length indicator. Mahogany cabinet with battery compartments. Without equipment $250



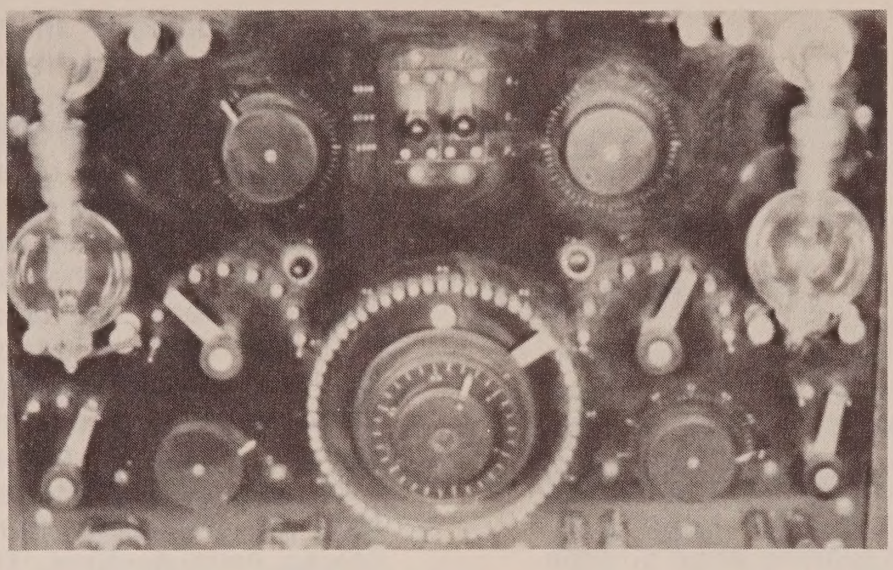
WARE BANTAM

AMPICO/WARE 1929



250 CHASSIS SHOWING ROTATING LOOP

C



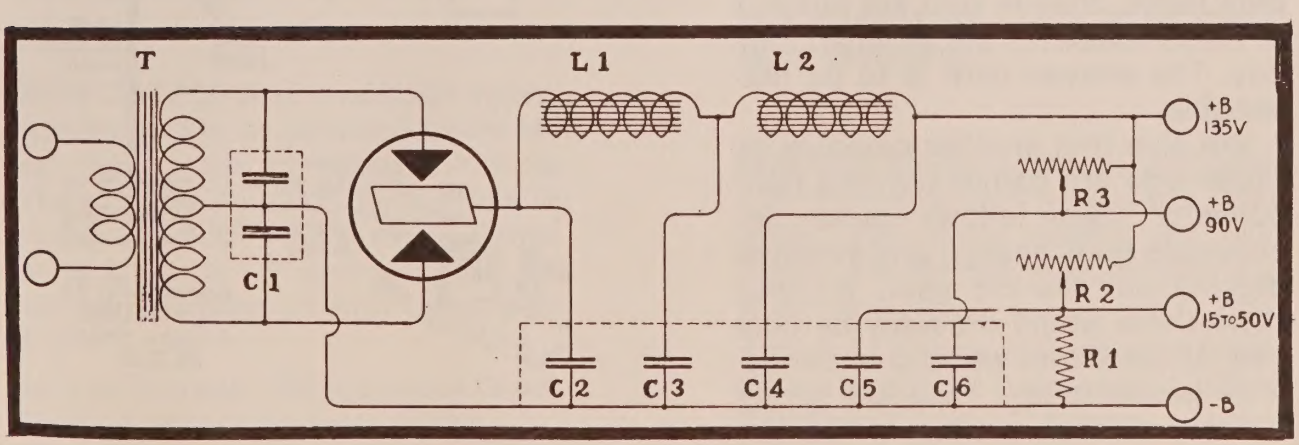
After his retirement, he pursued his hobby of ham radio. He lived his later years in Marlboro, Mass., and died at the age of 81. I feel he contributed much to the state of the art of early wireless and radio.

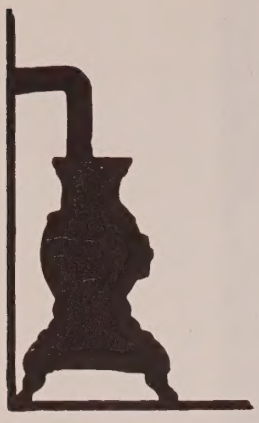
Sources, City of Marlboro, Files of General Radio.

END

The Raytheon Story In Our Next Gazette

"B" BATTERY ELIMINATOR





MEL'S CORNER

Here we go again on the subject of values on antique radio gear. With inflation running at an all time high, escalation in the price of the items we want is inevitable.

However, we should all keep in mind that true collectors get a great deal of satisfaction from their hobby. They may have several sets or a hundred, but they are in it for the fun and enjoyment of collecting.

These collectors usually pay fair and reasonable prices for the items they find from various sources. There are times when they have to buy entire lots of gear just to get the desirable items they need, and often are saddled with a lot of surplus which is traded off to other collectors, or sold. Entire collections sometimes come on the market, which usually means several collectors getting together for its acquisition.

These collectors are banded together in various radio organizations with a common goal. They realize that if an unusually high price is asked on some of their surplus items, they in turn are subject to these escalated prices when they buy. The answer here is to be reasonable.

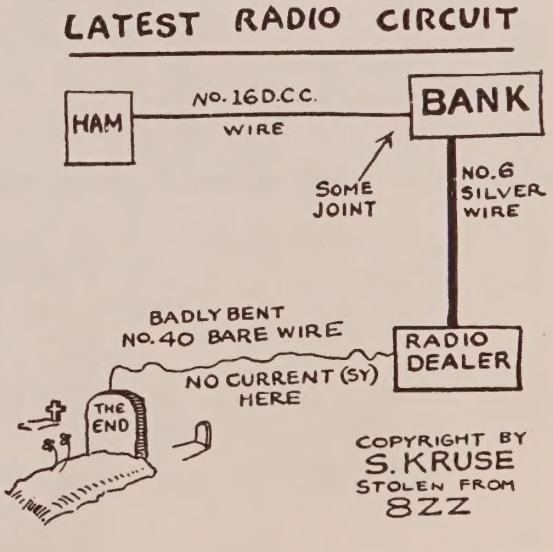
We also find another category of those who are half-dealer and half-collector. These fellows spend considerable time, energy, and expense digging out the old gear. Without them there would probably be only half of the items we find in collectors' hands today. They are surely entitled to their profits for all the trouble they go through in their diggings. They run up blind alleys, get over enthusiastic in their finds, often pay far more than an item is worth, take the good with the bad. They have to average out.

As this hobby of ours continues to grow, we will find more and more of the latter type. Those that are fair and reasonable in their dealings are respected and appreciated. They back their offers to the best of their ability in description and condition. They assure their customer of satisfaction or the return of the item.

In the mail recently we have seen lists of desirable items whose values have doubled. This is very discouraging to our new collectors. How much of a collection can they put together? How much can they afford to invest? Perhaps the law of supply and demand will take over as some of these unreasonable prices become NO SALE!

A NO SALE has a leveling factor the seller cannot ignore. All of which reminds us of two quotes:

1. If you can use it, and it's a bargain, buy it.
2. Henry Ford's motto years ago, "You either use it, or you lose it." And that applies to more than jut radio.



Ye Old Swap Shop

All ads and Swap Shop items are printed in the Gazette free of charge. We do ask that you write your ad on a separate sheet of paper, type if possible, and be sure to include your full name and address. We reserve the right to edit all ads. ARCA is not responsible for any transaction.

FOR SALE: Majestic Model 20, cathedral with service manual and all tubes. Needs minor repair. $55., you pay the postage.

Barry Evans, 11115 E. 50th Street, Kansas City, Missouri 64133

FOR SALE and/or TRADE: Riders Manuals, Supreme Manuals, tubes and other radio parts. SASE.

Charles A. Days, P.O. Box 205, S. Dartmouth, Massachusetts 02748

FOR SALE: Riders Abridged Vol. I to V, like new. $18. plus UPS for 12 pounds. Also Sale or Trade, Crosley Model 9-425. Portable 7" TV, $50.

John Wasiewicz, 229 Sarles Lane, Pleasantville, New York 10570

NEW CATALOGUE available listing reproductions of parts/components for restoration of antique radios. State needs. Custom parts made to order. Catalogue lists many items. Send $2. plus 50¢ postage. The $2. will be refunded on first order over $10.

Roland Matson, 388 Concord Road, Bedford, Massachusetts 01730

WANTED: Tubes, 53's, 7AF7, 7N7, 6L6, metal, and 2A3's.

Don Patterson, 636 Cambridge Road, Augusta, Georgia 30909

FOR SALE: Replica panels for AK vario couplers, variometers, Type 11 tuner, dials, knobs, pointers, binding post nuts, belt drives, and many more items. Send SASE for sheet listing descriptions and prices.

Keith Parry, 17557 Horace, Granada Hills, California 91344

WANTED: Pre-1935 microphones of unusual types. Send description of what you have available. Many old radios available here for trade for items I need for my collection.

Bob Paquette, 107 E. National, Milwaukee, Wisconsin 53208

FOR SALE: New battery types of military surplus. VT-24/864, six for $26.50, UPS prepaid. Crystal sets wanted. Send SASE for list of surplus items from my collection.

George Haymans, P.O. Box 2478, Gainesville, Georgia 30503

WANTED: Old medical and quack devices of various descriptions. Old x-ray tubes and spark gap diathermy items. Send description of what you have available.

O. Lindan, 1404 Dorsh Road, Cleveland, Ohio 44121

WANTED: Mirror in the lid, and other pre-1946 television sets, parts, literature. Especially looking for RCA TRK-5, 359 test set to complete RCA collection.

Arnold L. Chase, 9 Rushleigh Road, West Hartford, Connecticut 06117 Call Collect, (203) 521-5280

FOR SALE or SWAP: BC-9A Army 1920's 3-tube transmitter and receiver N.T., $150; Magnavox R-3, $50; Aerola Sr., early model and Aerola amplifier, no tubes, $185. NEED: Audio for Kennedy VI.

Bob Lane, 2301 Independence Avenue, Kansas City, Missouri 64124

PHOTO-DOCUMENTATION PROCESS. Protect your collection for insurance purposes. Fire, theft, and other perils. For details, write:

WIRELESS Photo Documentation Center, 160 South Country Road, East Patchogue, New York 11772

WANTED: Electro Importing E.I. gear of early days. Have items for Swap or Buy.

F. A. Nichols, 720 East Eldorado, Appleton, Wisconsin 54911

INTERESTED in early, unusual crystal detectors, brand names. Single tube regenerative and crystal sets of early types. State price and condition of items available.

Guy Martin, P.O. Box A, Azusa, California 91702

FOR SALE: Power supplies especially adapted to the operation of antique radios — variable ratings. Send SASE for spec sheet.

Gary Schneider, 6848 Commonwealth, Parma Heights, Ohio 44130

WANTED: Station dials for Victor R-32 and Ak type P chassis. Cabinets and dynamic speakers for Philco Models 18 and 90. Power transformer for RCA R-5; 2A6's. Knobs for RCA R-7 or Graybar equivalent.

Jim Moffet, 218 Shannon Lee, San Antonio, Texas 78216

WANTED: Variometer for Tuska 224; dial assembly for early (1936) Hallicrafters Sky Buddy.

Jim Barrows, 15121 41st Avenue, S.E., Bothell, Washington 98011

WANTED: Schematic for Aladdin Super Five, by Axle, Chicago, 1923.

Thomas R. Myers, 4199 Bishop, Detroit, Michigan 48224

FOR SALE OR TRADE: Connecticut T&E transmitter U.S. Army SCR-65 first type used in airplanes, V.R. page 34. Want Kennedy 281, or AK9 or 9C, or WWI SCR54A-80X DeForest set.

D. Shanks, 115 Baldwin Street, Bloomfield, New Jersey 07003.

FOR SALE OR TRADE: Many QST-CQ-73-Ham Radio Magazines 1923-1977. Write your needs. SASE.

J. Wasiewicz, 229 Sarles Lane, Pleasantville, New York 10570.

FOR SALE: Various sizes of Litz wire now available, including replacement size for DeForest loop and others. State needs. Sample furnished with SASE.

Charles Barone, 5628 N. Prospect Avenue, Norwood Park Twnp., Illinois 60631

FOR SALE: Five DeForest DV-5's with three filaments good, two open. Good, $20 each. Duds $10. All for $70.

Bruce Richardson, Box 741, Troy, Montana 59935

WANTED: Good condition Federal 61.

J. E. Cunningham, 675 W. Ardmore, Roselle, Illinois 60172

WANTED: RCA TRK-12 television receiver in any condition. Also interested in other early TVs, RCA especially. Have Edison phonographs and some radios to trade.

Jeff Lendaro, 25 Fanton Road, Danbury Connecticut 06810

WANTED: Crosley Harko Sr. & Model I crystal set. DeForest Everyman crystal set, and radio Home. Federal 57 & 59, Grebe CR3, 5, 6, 18. Kennedy 281 & amp, Radiola II, VI, IX, X crystal set. Wireless sets.

Larry Babcock, 8095 Centre Lane, East Amherst, New York 14051

WANTED: Radiola 16, 20, 25, & 60. Radiola speakers ÷100, 100A, 103, UZ1320 & UZ1325. Rheostat for Radiola 17, DeForest tubes and any information on tube rejuvenation.

Jim Davis, 1911A 21st STreet, Lubbock, Texas 79411

WANTED: Antique radio collector in need of a Riders Manual No. 1 at fair price.

Hugo Castelle, 1406 E. 5th Avenue, Juliet, Illinois 60433

WANTED: Cabinet for AK20 compact, QST May, 1959, Radio News, June, 1922, Stancor Transformers A53 or A53C, Thordarson transformers 20A17 for audio stage replacements.

David McKenzie, 170 West 53rd Street, Hialeah, Florida 33012

FOR SALE: AK21, AK41, Echophone V-3, Pilot AC Super Wasp, Crosley 50, 51, 4-29; used 201A's; 201A's & other early tubes in boxes. Magazines, headsets, speakers, other radios. SASE for list.

Al Jochem, 2047 College Avenue, Quincy, Illinois 62301

END

17 February 1981

Dear Mr. Denk:

Please find enclosed a check which I hope is sufficient to cover dues for my husband, Bruce Lacoste, for 1981. He has previously been a member of ARCA but missed out on this year.

My husband and I are both in the U.S. Navy and we move frequently. This makes it difficult to keep up with his hobby. As our collection of radios grows, each move becomes a little more difficult. In the last few years, we have collected over 30 pieces. We have some choice models, and enjoy them very much.

During our last leave we had the opportunity to visit Dr. Ralph Muchow at his museum in Elgin. We definitely recommend a visit to anyone in that area interested in radio. Dr. Muchow has a truly impressive collection and served as a marvelous host during our visit.

My husband is currently on a cruise on one of the Navy ships. Therefore, please send his copies of the Gazette to the following address:

ICI Bruce J. Lacoste
USS McCloy (FF-1038)
FPO, N.Y. 09578

I'm sure this will be a pleasant surprise for him and he will enjoy it very much. If the amount I have sent is more than enough, please accept the remaining amount as a donation.

Thank you.

Sincerely,
Cynthia Lacoste

We are advised that the charge for rooms at the Holiday Inn, Rivermont Centre, for the meet in Louisville is:

Double Room — $37.00
Single Room — $31.00

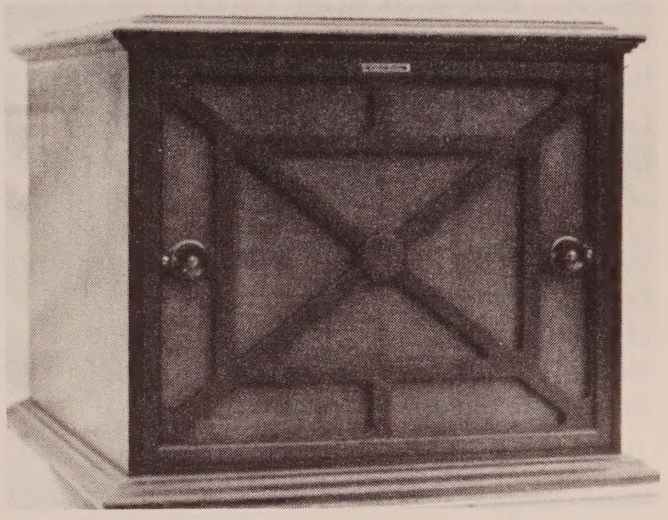
The requests for reservations are coming in rapidly, so we would advise everyone to make his as soon as possible, in order to be accommodated.

WESTERN ELECTRIC
14A Audio Amplifier
by Floyd A. Paul

W. E. made many audio components in the 1920's. Among them were horn speakers, audio amplifiers, tubes and transformers. This article examines the 14A amplifier. The two photographs show opposite ends of the 14A. One end has a speaker grill cloth, an off-on switch (on the right side of the speaker grill panel) and a multi-position volume control switch (on the left hand side). The opposite end of the 14A cabinet has a pair of doors which are shown opened and reveal three 216A tubes (upper right hand tube is the input tube) and the other two tubes on the left, the push pull output tubes. Voltage and input signal terminals are along the bottom of the panel. Four terminals along the top of the panel (two of the terminals are swivelled at a 45° angle) accept plug-in "C" batteries for bias (a cover plate for those batteries is missing from the author's set). In the middle of the panel is the armature type horn speaker driver unit (a 527W) and on the right in the middle is the rotary switch volume control. The switch knob on the left side of the speaker grill panel is on a long shaft that rotates this five contact switch unit.

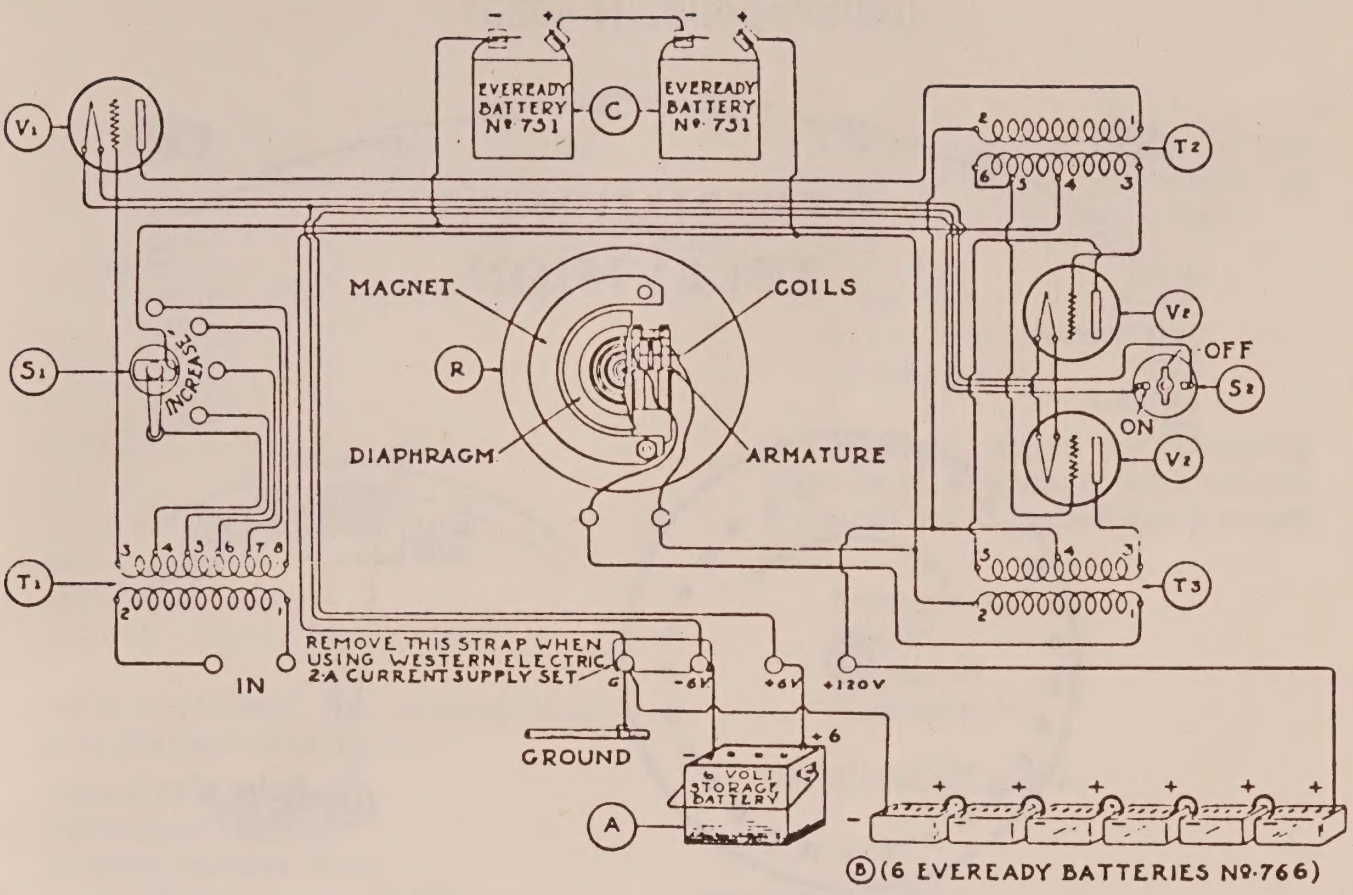
Inside the 14A cabinet, the driver's sound enters a wooden funnel design that is best described as a reentrant cavity that returns sound back toward the driver and then again reflects sound back towards the cabinet opening.

The W. E. 14A equipment is typical early W. E. design. Parts are good quality and ruggedly mounted on a solid bakelite panel. A schematic diagram of the 14A unit is shown.

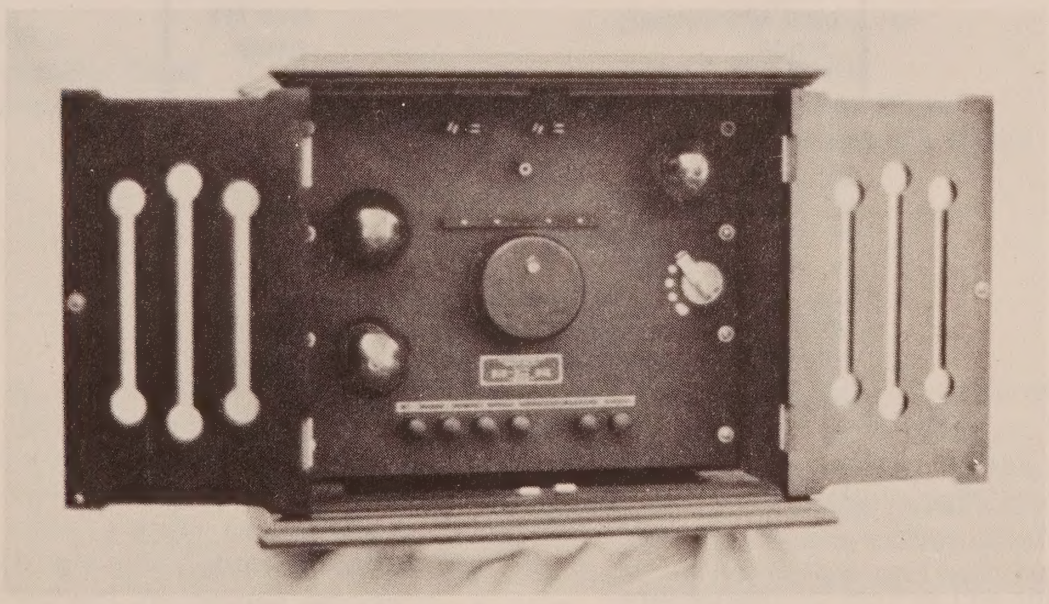


The 14A was tested with 01A tubes pugged into the 216A sockets. The latter use about 1.1A for each filament and the author did not have a 3.3A ripple free low voltage supply. Tests were performed to observe performance of the 14A and to check the general quality of the unit.

The tests used on the filaments, -9V bias and 85V on the plates. The I_p consumption was 9.5 ma. at these conditions for all three tubes. The input voltage of 0.1V ac was selected and a frequency scan was performed. The horn responded well in the 200 hz to 3,500 hz range, reasonably well to the 5 khz region before beginning a drop off. Below 200 hz the sound dropped off dramatically by 170 hz. The input volume was adjustable in five steps by the turns ratio transformer switch which provided one to .45, .8, 1.0, 1.5 and 2 turns ratios.

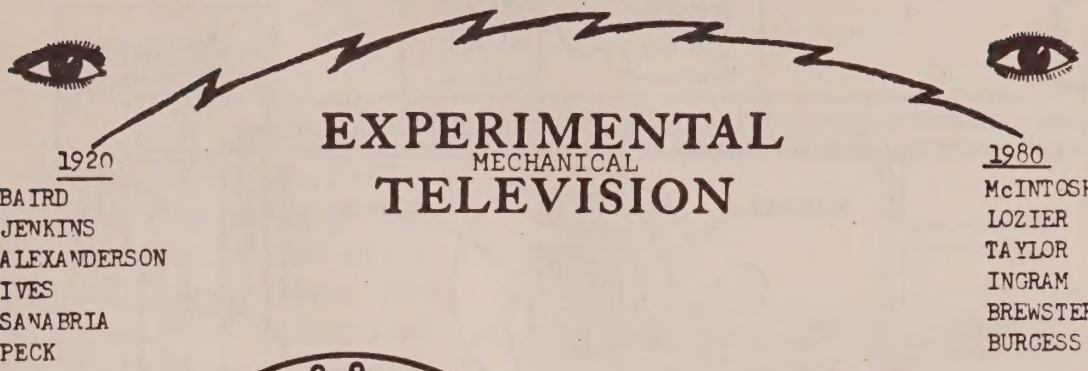


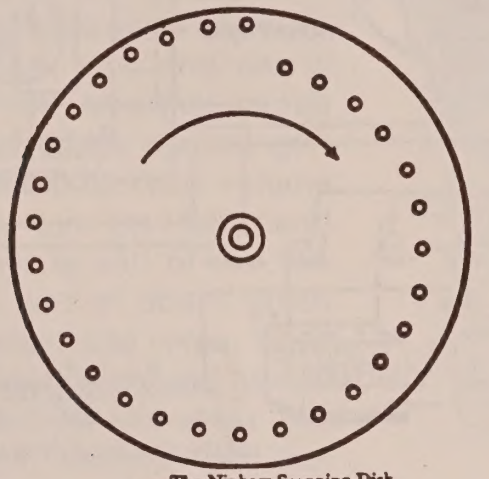
T_1 218-A Input Transformer for connecting the radio receiving set to the input circuit of the first vacuum tube.
S_1 Volume Control Switch for adjusting the volume of sound projected from the horn.
V_1 216-A Vacuum Tube effecting first stage of amplification.
T_2 218-G Input Transformer for stepping up the voltage to the second stage of amplification.
V_2 216-A Vacuum Tubes effecting the second stage of amplification.
T_3 111-A Output Transformer for delivering the energy from the second stage amplifying tubes to the loud speaking receiver.
S_2 Filament Current Switch.
R Loud Speaking Receiver for transforming electrical energy from T_3 into sound energy to be projected through the horn.
A Filament or "A" Battery.
B Plate or "B" Battery.
C Grid or "C" Battery.



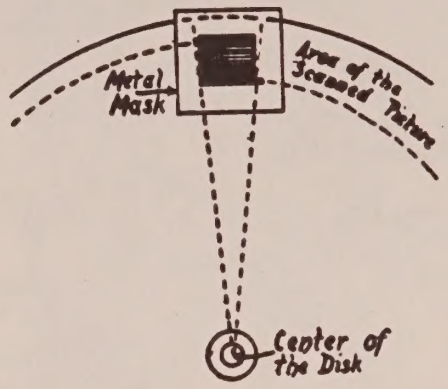
END

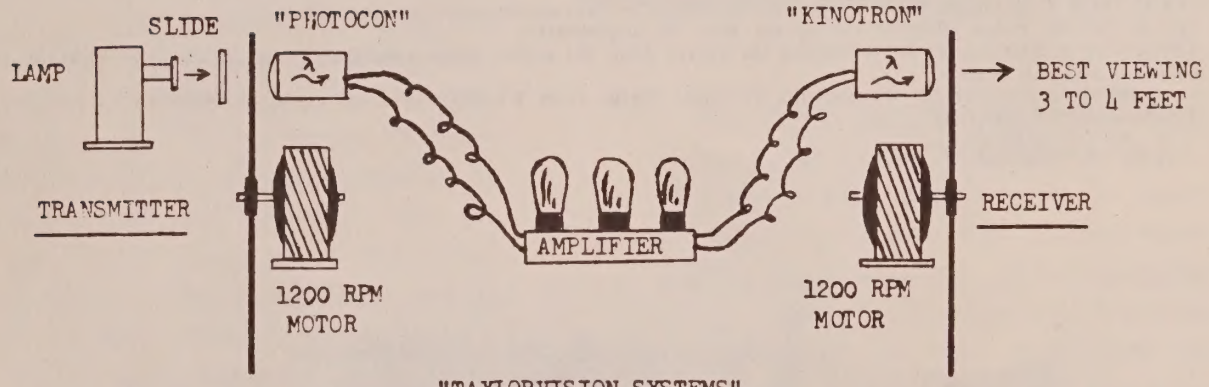
Ed Taylor Radio Museum
245 N. Oakland Avenue
Indianapolis, IN 46201





—The Nipkow Scanning Disk.





"TAYLORVISION SYSTEMS"
SPECIFICATIONS

10" Scanning Disc
25 Hole Spiral
20 Pictures per Second
1" Picture Size
Beau Electronics Co. Synchronous Motors
"PHOTOCON" : Motorola Phototransistor MRD-300
"KINOTRON" : Data Display Products. LED 200-B-CR
Solid State Amplifier & Power Supply

Ed Taylor will put on his demonstration of Scanning Disk Television at our meet in Louisville.

Don't miss it.

Ken McIntosh has a TV book called "A Collectors Review of Television Technology." Please contact him at 907 Radcliff Road, Baltimore, Maryland 21204 if you want details.

The Antique Radio Gazette is published quarterly in Madison, Connecticut.

Send ARTICLES to be published to:

John E. Drake
23 East Wharf Road
P.O. Box 942
Madison, Connecticut 06443

Send COPY for ADS to:

Mel Comer
205 Roberts Road
Ardmore, Pennsylvania 19003

APPLICATIONS for membership and payment of DUES to:

Jane & William Denk
Secretary-Treasurer
81 Steeplechase Road
Devon, Pennsylvania 19333

All matters re. the OLD EQUIPMENT CONTEST to:

Ross Smith
1133 Strong
Elkhart, Indiana46514

Editor for ANTIQUE TELEVISION receivers:

Jack Davis
63 Midchester Road
White Plains, New York 10606

It is our intention to have the Gazette published as closely as possible to the following dates:

March 31
June 30
September 30
December 31

The closing dates for receiving material of all kinds, in order to have it appear in the current issue would be:

February 15
May 15
August 15
November 15

OFFICERS OF ARCA:

President

John E. Drake
23 East Wharf Road
P.O. Box 942
Madison, Connecticut 06443

Vice President

Ross Smith
1133 Strong
Elkhart, Indiana 46514

Secretary-Treasurer

Jane & Bill Denk
81 Steeplechase Road
Devon, Pennsylvania 19333

The Antique Radio Club of America was incorporated in the State of Kentucky, in September, 1972. The first meeting was held at the Marriott Motor Inn, Washington, D.C., on September 23, 1972. At this meeting, by-laws were read and approved and directors selected. We feel that the inception of this Club is a giant step in bringing together those individuals whose chief interest lies in the area of early radio. We invite all collectors and historians of the subject to join the Club. A note to William E. Denk, Secretary, 81 Steeplechase Road, Devon, Pennsylvania 19333, will bring you an application blank by return mail.

Ware NEUTRODYNE Receivers

"To make a happy fireside clime
To weans and wife,
That's the true pathos and sublime
Of human life."
—Burns

As a Christmas Gift, there are few things other than radio that can contribute so much of all that is worth while to the varied interests of family life. For the young folks, sprightly dance music, news of all the big events in outdoor sports; for their elders, enlightening talks on current events, educational courses, political news, musical programs of the finest character; and for the old and the "shut-ins" a contact with the world outside that brightens their lives beyond measure.

Folks listen in delighted amazement at the naturalness and tonal beauty of every selection heard on the Ware Neutrodyne. So natural is the reproduction, in fact, that the singer or instrumentalist seems to stand in flesh and blood before you—a playing, singing, living presence. And the youngsters with a tingle in their toes say that they never heard such dance music as their Ware brings them. Purity of tone, simplicity of tuning, ability to get the station desired, and to exclude others, give the owner of the Ware Neutrodyne the deepest satisfaction.

There are three types of Ware Neutrodyne receivers—the T with three tubes, one reflexed; the X with four tubes, one reflexed—both operating on dry cell batteries; and the W with five tubes, not reflexed, operating on a six volt storage battery. The reflexing of the T and X is worked out on a new principle applied only to Ware Neutrodyne Receivers, giving the full equivalent of an additional tube. Models TU, XU, and WU, with the same circuits, respectively, as T, X and W, are standing cabinet models with inbuilt loud speakers.

Regardless of the price, all Ware Neutrodyne Receivers have the same beautiful tone quality; the difference between them being a matter of range and power.

To appreciate the Ware you must see and hear it, which you can do at the leading phonograph or radio dealers'. We will gladly tell you who carries it in your neighborhood. Catalogue with full descriptions will be sent on request.

Type T—10¼" high, 14" wide, 13½" deep. One stage radio frequency amplification, detector; and two stages of audio frequency amplification. Operates loud speaker. Without accessories, $65.

Type X—8½" high, 21½" wide, 10¾" deep. Two stages radio frequency amplification, detector and two stages audio frequency amplification. A double-scaled volt-meter indicates voltages of both A and B batteries. Operates loud speaker. Without accessories, $150.

Type W—8½" high, 21½" wide, 10¾" deep. Two stages radio frequency amplification, detector and two stages audio frequency amplification. A double-scaled volt-meter indicates voltages of A and B batteries. Operates loud speaker. Without accessories, $175.

Type TU—Same circuit as Type T, in brown mahogany or walnut standing cabinet, 34½" high, 18¾" wide, 18¾" deep. Loud speaker built into the cabinet. Without accessories, $150.

Type XU—Same circuit as Type X, in brown mahogany or walnut cabinet, 44" high, 27¾" wide, 18¾" deep. Loud speaker built into the cabinet. Without accessories, $275.

Type WU—Same circuit as Type W, in brown mahogany or walnut cabinet, 44" high, 27¾" wide, 18¾" deep. Loud speaker built into the cabinet. Without accessories, $300.

MAKE IT A WARE THIS CHRISTMAS

Ware
RADIO CORPORATION
529-549 WEST 42nd STREET
NEW YORK

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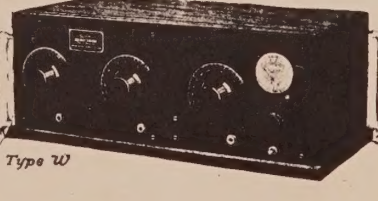
Type XU



Type W

Type TU